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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/041,896	01/07/2002	Brenda D. Kraus	MI22-1859	5572

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WELLS ST. JOHN P.S.  
601 W. FIRST AVENUE, SUITE 1300  
SPOKANE, WA 99201

EXAMINER
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HUYNH, YENNHU B

ART UNIT	PAPER NUMBER
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2813

DATE MAILED: 09/09/2003

16

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

10/041,896

Applicant(s)

KRAUS ET AL.

Examiner

Yennhu B Huynh

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 29 May 2003.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 21-28 and 64-75 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 21-28 and 64-75 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

## Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 14.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

### DETAILED ACTION

This Office Action is in response to the Amendment filed on 5/29/03.

Claims 1-20, 29-41 & 57-63 and 42-56 have been cancelled by  
Amendments filed on 4/16/02, 5/13/02 and 8/12/02:

#### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for  
all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 21, 22, 24-27 and 66-75 are rejected under 35 U.S.C. 103(a) as  
being unpatentable over Tsu et al. (U.S. 6,294,420B1) in view of Miller et al.  
(U.S. 6,072,211).

Tsu et al. disclose a novel integrated circuit capacitor, which include:

Re. claims 21, 22, 74 & 75: an array of word lines 56a - 56d forming gate  
of FET and an array of bit lines 60, individual FET comprising a gate comprising  
a pair of source/drain regions (col.7 & 8, lines 63-5, col. 9, lines 12-20, figs. 4 &  
5) a plurality of memory cell storage capacitors associated with the field effect  
transistors, individual storage capacitors comprising a first capacitor electrode 12

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in electrical connection with one of a pair of source/drain regions, of one of the FETs, and a second capacitor electrode 14, a capacitor dielectric region 16; the region received intermediate the first and second capacitor electrodes, the region comprising nitride layer 22, the other of the pair of source/drain regions of the one field effect transistor being in electrical connection with one of the bit lines 60; wherein the bit lines are received elevationally outward of the memory cell storage capacitors (figs.4,5, col. 8 & 9, lines 14-42).

However, Tsu et al. do not disclose wherein the capacitor dielectric region received immediately/contacts each of the first and second capacitor electrodes and comprises/consists essentially of dielectric AlN .

Miller et al. disclose a semiconductor package forms an impedance matching capacitor, which include a capacitor dielectric region 12 on substrate 11 as the second plate of capacitor and conductor layer 19 formed on the top of dielectric 12 as the first plate of capacitor (col.1 & 2, lines 63-11, figs. 1-4).

It would have been obvious to one having skill in the art at the time the invention was made to modify Tsu et al. invention by incorporating capacitor dielectric layer consists essentially of AlN to reduce carbon and oxygen incorporation in order to prevent current leakage problem.

Neither Tsu et al. nor Miller et al. disclose the range of the dielectric AlN and oxide layer thickness being less than or equal to 50 or 60 angstroms .

Re. claims 24-27 and 66-73: the range of dielectric AlN and oxide layer thickness is considered to involve routine optimization while has been held to be

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within the level of ordinary skill in the art, As noted In re Aller 105 USPQ233, 255 (CCPA 1955), the selection of reaction parameters such as temperature and concentration would have been obvious.

"Normally, it is to expected that a change in temperature, or in range, concentration, cycles, thickness, would be an unpatentable modification. Under some circumstance, however, changes such as these may be impart patentability to a process if the particular ranges claimed produce a new and unexpected result which is different in kind and not merely degree from the results of the prior art ... such ranges are termed "critical ranges and the applicant has the burden of proving such criticality ... More particularly, where the general conditions of a claim are disclosed in the prior art, it is not inventive to discover the optimum or workable ranges by routine experimentation." In re Aller 105 USPQ233, 255 (CCPA 1955). See also In re Waite 77 USPQ 586 (CCPA 1948); In re Scherl 70 USPQ 204 (CCPA 1946); In re Irmischer 66 USPQ 314 (CCPA 1945); In re Norman 66 USPQ 308 USPQ 308 (CCPA 1945); In re Swenson 56 USPQ 372 (CPA 1942); In re Sola 25 USPQ 433 (CCPA 1935); In re Dreyfus 24 USPQ 52 (CCPA 1934).

Claim 23 is rejected under 35 U.S.C. 103(a) as being unpatentable over Tsu et al. (U.S. 6,294,420B1) in view of Miller et al. (U.S. 6,072,211) and Dornfest et al. (U.S. 6,358,810B1).

Tsu et al. and Miller et al. disclose substantially all of claimed invention, but do not disclose an oxide formed on at least one of the first and second capacitor electrodes.

Re. claim 23: Dornfest et al. disclose a multi-layer semiconductor memory device, which include a native oxide formed on at least one of the first and second capacitor electrodes layer 44 and 36 (col. ~~34-49~~ and col. 4 lines 18-68).

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It would have been obvious to one having skill in the art at the time the invention was made to modify Tsu et al. and Miller et al. invention by incorporating a native oxide formed on the first and second capacitor electrodes, to obtain a thin film insulator at a high temperature by its electrical properties.

Claims 28,64 & 65 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tsu et al. (U.S. 6,294,420B1) in view of Miller et al. (U.S. 6,072,211) and Carpenter (U.S. 5,183,684).

Tsu et al. and Miller et al. disclose substantially all of the claimed invention, except wherein the AlN is substantially amorphous.

-Re. claims 28,64 & 65: Carpenter disclose a multi-layer coating AlN in forming capacitor, which include a capacitor amorphous dielectric AlN (col.7 & 8, lines 59-68 ) .

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the invention of Tsu et al. and Miller et al. by incorporating a substantially amorphous dielectric AlN material to reduce carbon and oxygen in order to prevent current leakage problem.

### ***Response to Arguments***

Applicant's arguments with respect to claims 21-28 and 64-75 have been considered but are moot in view of the new ground(s) of rejection.

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***Conclusion***

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Yennhu B Huynh whose telephone number is 703-308-6110. The examiner can normally be reached on 8.30AM-7.00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Carl Whitehead, Jr., can be reached on 703-308-4940. The fax phone numbers for the organization where this application or proceeding is assigned are 703-308-7722 for regular communications and 703-308-7722 for After Final communications.

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Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-7724.

YNBH,  
8/26/03

  
CARL WHITEHEAD, JR.  
SUPERVISORY PATENT EXAMINER  
TECHNOLOGY CENTER 2800